NFPA 80 – 2007
Fire Doors and the Codes for Swinging Doors

NFPA 80

• NFPA 80 "Standard for Fire Doors and Other Opening Protectives" is a key standard that is sited in numerous locations in the codes.

NFPA 80 and Fire Doors and the Codes

• *The 2007 version of NFPA 80 states that annual maintenance inspections of Fire Doors is now required:* Fire door assemblies shall be inspected and tested not less than annually, and a written record of the inspection shall be signed and kept for inspection by the AHJ.

• *This now will affect you:* If you own the building or are managing the building; you are required to inspect and test your Fire door assemblies annually and keep a signed written record of the inspection for the AHJ.

• *The codes require a minimum Fire Door checklist:* A minimum list of items to check for compliance to NFPA 80- 2007; are described in this document.

Your Responsibility

• Label Service – certify that the door assembly meets the test criteria
• If you are an inspector – note all items; You are not certifying the door assembly
• If you are a building owner – once there is found some problem correct the problem
• Door, Frame, and Hardware Consultant – business as usual –help the customer meet the requirements by providing the best door, frame, hardware, and service available
• AHJ – Authority Having Jurisdiction – Final Judge

5.2* Inspections.

• 5.2.1* Fire door assemblies shall be inspected and tested not less than annually, and a written record of the inspection shall be signed and kept for inspection by the AHJ.

5.2.2* Performance-Based Option.

• 5.2.2.1 As an alternate means of compliance with 5.2.1, subject to the AHJ, fire door assemblies shall be permitted to be inspected, tested, and maintained under a written performance- based program.

• 5.2.2.2 Goals established under a performance based program shall provide assurance that the fire door assembly will perform its intended function when exposed to fire conditions.

• 5.2.2.3 Technical justification for inspection, testing, and maintenance intervals shall be documented.

• 5.2.2.4 The performance-based option shall include historical data acceptable to the AHJ.

5.2.3 Functional Testing.

• 5.2.3.1 Functional testing of fire door and window assemblies shall be performed by individuals with knowledge and understanding of the operating components of the type of door being subject to testing.

• 5.2.3.2 Before testing, a visual inspection shall be performed to identify any damaged or missing parts that can create a hazard during testing or affect operation or resetting.

5.2.4 Swinging Doors with Builders Hardware or Fire Door Hardware.

• 5.2.4.1 Fire door assemblies shall be visually inspected from both sides to assess the overall condition of door assembly.

• 5.2.4.2 As a minimum, the following items shall be verified:

(1) No open holes or breaks exist in surfaces of either the door or frame.

(2) Glazing, vision light frames, and glazing beads are intact and securely fastened in place, if so equipped.

(3) The door, frame, hinges, hardware, and noncombustible threshold are secured, aligned, and in working order with no visible signs of damage.

(4) No parts are missing or broken.

(5) Door clearances at the door edge to the frame, on the pull side of the door, do not exceed clearances listed in 4.8.4 and 6.3.1.

4.8.4 Clearance
- 4.8.4.1 The clearance under the bottom of the door shall be a maximum of ¾ inch (19 mm).
- 4.8.4.2 Where the bottom of the door is more than 38 in. (965 mm) above the finished floor, the maximum clearance shall not exceed 3/8 inch (9.5 mm) or as specified by the manufacturer's label service procedure.

6.3.1.7 Clearances
- 6.3.1.7.1 The clearances between the top and vertical edges of the door and the frame, and the meeting edges of doors swinging in pairs, shall be 1/8 in. +/- 1/16 in. (3.18 mm +/- 1.59 mm) for steel doors and shall not exceed 1/8 in. (3.18 mm) for wood doors.
- 6.3.1.7.2 Clearances are measured from the pull face of the door

(6) The self-closing device is operational, that is, the active door completely closes when operated from the full open position.

(7) If a coordinator is installed, the inactive leaf closes before active leaf.

(8) Latching hardware operates and secures the door when it is in the closed position.

(9) Auxiliary hardware items that interfere or prohibit operation are not installed on the door or frame.

(10) No field modifications to the door assembly have been performed that void the label.

(11) Gasketing and edge seals, where required, are inspected to verify their presence and integrity.

Door Modifications

• If there are any modifications to the door assembly the label service is to be notified.
• Under the 2007 NFPA 80 There are two options:
– Field Inspection required
– Label service writes an approval letter to be kept on file

The ICC

• The International Code Council is a cooperative arrangement of the three model code groups that has produced an integrated set of codes. The "I" Codes.
– **International Building Code**
– **International Residential Code**
– International Plumbing Code
– International Mechanical Code
– ICC Electrical Code
– **International Fire Code**
– International Fuel Gas Code
– International Energy Conservation Code
– International Zoning Code
– International Property Maintenance Code
– International Private Sewage Disposal Code

What Does the IBC Say?

• "**715.3.1 Side-hinged or pivoted swinging doors. Side-hinged and pivoted swinging** doors shall be tested in accordance with NFPA 252 or UL10C. After 5 minutes into the NFPA 252 test the neutral pressure level in the furnace shall be established at 40 inches (1016 mm) or less above the sill."

• "**715.3.2 Other types of doors. Other types** of doors, including swinging elevator doors, shall be tested in accordance with NFPA 252 or UL 10B. The pressure in the furnace shall be maintained as nearly equal to atmospheric pressure as possible. Once established, the pressure shall be maintained during the entire test period."

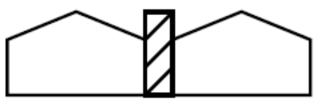
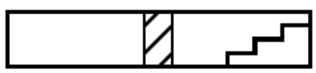
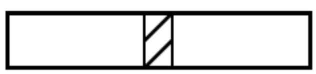
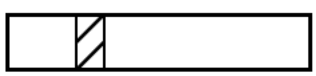
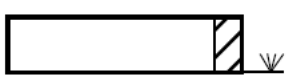
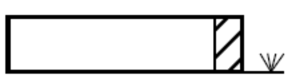
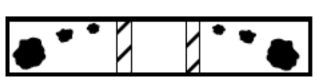
Table 715.3

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM OPENING PROTECTION ASSEMBLY (hours)
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4 3 2 1 ½	3 3 1 ½ 1 ½
Fire barriers of 1-hour fire-resistance-rated construction: Shaft and exit enclosure walls Other fire barriers	 1 1	 1 ¾
Fire partitions: Corridor walls Other fire partitions	 1 0.5 1	 1/3 1/3 ¾
Exterior walls	3 2 1	1 ½ 1 ½ ¾

Fire testing of doors and hardware and the resulting labeling authorities granted, is a complex subject that is better understood when basic rules and guidelines are applied.

The fire rating classification of the wall into which the door is installed dictates the required fire rating of the door. The location of the wall in the building and prevailing building code establish the wall's fire rating. The associated door ratings are shown in the table below.

Fire doors are "rated" by time (in minutes or hours) that a door can withstand exposure to fire test conditions. Hourly ratings include 1-1/2-hours, 1-hour, 3/4-hour, and 1/3-hour, with the maximum rating required of any swinging type fire door being three hours.

Opening	Wall Rating	Door and Frame Rating	Description and Use
	4 Hour	3 Hour (180 minutes)	These openings are in walls that separate buildings or divide a single building into designated fire areas.
	2 Hour	1-1/2 Hour (90 minute)	Openings of this type are used in enclosures of vertical communication or egress through buildings. Examples of these types of openings include stairwells and elevator shafts.
	1 Hour	1 Hour (60 minute)	These door and frame assemblies divide occupancies in a building.
	1 Hour	3/4 Hour (45 minute)	For use where there are openings in corridors or room partitions.
	2 Hour	1-1/2 Hour (90 minute)	This opening is in a wall where there is the potential for severe fire exposure from the exterior of the building.
	1 Hour	3/4 Hour (45 minute)	This opening is in an exterior wall that has the potential to be exposed to moderate to light fire from the exterior of the building.
	1 Hour	1/3 Hour (20 minute)	These openings are in corridors where smoke and draft control is required. The minimum wall rating is 1 hour.

Summary:
Doors are rated for three-fourths of the rating of the surrounding wall: A 3-hour door is used in a 4-hour rated wall; a 1-1/2-hour fire door is used in a 2-hour rated wall; and a 3/4-hour door is used in a one-hour rated wall. The notable exception is that 1/3-hour rated doors are also used with one hour rated walls. However, a door with a higher fire rating than the opening requires may also be used. For example, a door rated for 3 hours may be used in a 1-1/2- hour opening. All requirements for the 3 hour rating, such as maximum glass size, door size, and other restrictions for the higher rated door must be met.

The International Residential Code - IRC

• We do not consider this application to be a fire rated opening. However, use of a labeled fire door in the garage to home opening does comply with the code. Therefore, we have no restrictions that apply to this situation.
• You can always use fire rated components in openings that don't have to be fire rated per NFPA 80!
• Only mention of Fire Door is for garage to living space.
• Allows solid wood or steel minimum 1 3/8" thick doors OR labeled 20 minute fire door.
• Does not require fire rated frame, hardware or closers.

Four Almost Identical Standards.

• ASTM - E2074
– Replaces E152
– Includes "Positive Pressure"
• NFPA - NFPA 252 allows for "Positive Pressure" option.
• UL 10C - Published in 1998.
• Part I of UBC 7-2-1997.

Fire Test Basics – "Acceptance Criteria"

• No "through penetrations" (holes).
• No sustained flaming on unexposed (non-fire) face.
• Deflection limited to 1.5 times door thickness.
• Must withstand fire hose impact test without developing through openings.
• Must remain latched and separation between pairs is limited (3/8").

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